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LETTER DATED 29 MAY 1992 FROM THE REPRESENTATIVE OF NORWAY ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING A SUMMARY OF A STUDY ON A COMPREHENSIVE TEST-BAN TREATY

My delegation would request your kind assistance in having the enclosed contribution by Norway circulated as a CD document.

The document gives a summary of a study on a Comprehensive Test Ban Treaty which was the subject of a Workshop in Oslo in late March this year.

The full report from the study will be made available later.

(Signed) Jostein Bernhardsen
Minister Counsellor

GE.92-62633

Introduction

For many years the achievement of a Comprehensive Test-Ban Treaty (CTBT) has been a central Norwegian foreign policy goal. A total and permanent ban on all nuclear testing is essential in order to halt effectively both the vertical and horizontal proliferation of nuclear weapons. Furthermore, another important reason for the discontinuance of all nuclear test explosions is the environmental and health risks associated with underground nuclear explosions.

The Conference on Disarmament is an appropriate forum for dealing with the issue of a Comprehensive Test-Ban Treaty. The Norwegian Ministry of Foreign Affairs wished to contribute to the work of the Conference on Disarmament when it took the initiative to carry out a study on some of the most important questions related to a CTBT.

Individual chapters were prepared by renowned international experts and modified in view of comments at a workshop held in Oslo late in March 1992. These chapters discuss reasons for nuclear testing, the history of public opinion on the matter, environmental effects of underground nuclear explosions, partial test limitation treaties in force, attempts at reaching a CTBT, and verifying compliance with a CTBT.

A final chapter presents the assessment of the experts assembled at the workshop on the utility and feasibility of a CTBT, based on the material of the individual chapters and the discussion and analysis at the workshop. This document consists of the final chapter of the study.

The members of the expert group were:

- Professor Steven A. Fetter
  University of Maryland
- Professor Trevor Findlay
  The Australian National University
- Professor Joseph Rotblat
  Pugwash Conferences on Science and World Affairs
- Professor Richard L. Garwin
  Columbia University/IBM Research Division
- Dr. Jozef Goldblat
  Arms Control Consultant
  Senior Lecturer and Research Fellow at the Geneva Graduate Institute of International Studies
- Phil.lic. Jan Prawitz
  Ministry of Defence, Sweden
- Director Frode Ringdal
  Norwegian Seismic Array (NORSAR)

The report was finalized at a workshop in Oslo 30-31 March 1992. Director Sverre Lodgaard of the International Peace Research Institute, Oslo, chaired the workshop.

PERSPECTIVES FOR A FUTURE COMPREHENSIVE TEST-BAN TREATY (CTBT)

I. Purpose and objectives of a CTBT

Ever since the destruction of Hiroshima and Nagasaki in 1945, nuclear test explosions have served as a constant reminder of the threat to the survival of mankind. For years they were also seen as a manifestation of the nuclear arms race and of the competition between the super-Powers for world hegemony.

Nuclear testing is now on the decline. In 1991, the total number of test explosions was the lowest in 30 years. At the same time, major reductions in the nuclear armories are being planned.

The main argument for a CTBT is no longer the need to halt the arms race among the nuclear-weapon States. Today, the two overriding concerns are:

- the environmental effects of continued nuclear testing;

- the dangers of nuclear proliferation.

These aspects, as well as the military and political implications of a CTBT are discussed in detail in the various chapters of this report. A brief summary of the motivation for a CTBT is given below:

Environmental aspects

One of the central purposes of the 1963 Partial Test-Ban Treaty was to reduce the radiation hazard from nuclear tests. This has been borne out by the experience since then, but nevertheless there are numerous examples of venting of radioactive debris following underground nuclear tests.

Venting has occurred at all the major nuclear test sites, and has in some cases been detected across national borders. In the United States, a particularly serious incident was the venting from the Baneberry test on 18 December 1970, which was also registered in Canada. At the Semipalatinsk test site in Kazakhstan, many people appear to have been exposed over the years to significant doses of radiation after venting. A recent example of venting at the Novaya Zemlya test site in the Arctic part of Russia is the nuclear explosion on 2 August 1987, which caused radioactivity to be detected in Scandinavia.

An almost permanent legacy of underground tests is the inventory of long-lived radioactive elements deposited underground. In terms of health effects, this addition to the radioactive burden is small. However in some cases, as in the Moruroa Atoll, leakage may occur also in the short term. Little is known about the long term effects of such contamination, and this is clearly a case for concern.

Special concern has been expressed in the Nordic countries about the potentially adverse effects of continuing nuclear testing in the fragile Arctic environment of Novaya Zemlya.

A CTBT would put an end to the additional contamination of the environment with radioactive substances released by future nuclear explosions.

Non-proliferation aspects

A CTBT would help legitimize increased international pressure on the nuclear threshold countries who have not joined the NPT to forgo the nuclear weapon option. In some cases, regional approaches to a CTBT might be important steps toward this aim.

A CTBT would strengthen the non-proliferation regime by eliminating one element of friction concerning the inequality of the obligations assumed under the Non-Proliferation Treaty by the nuclear haves and nuclear have-nots.

A CTBT would satisfy an important requirement put forward by some non-nuclear-weapon countries for the extension of the duration of the Non-Proliferation Treaty after 1995 - for another lengthy period (or periods) or indefinitely.

In principle, it would be possible for a non-nuclear-weapon State to build a nuclear armoury without testing. This is surely far more feasible than it was in 1945 or during the 1950s. However, in an era in which both a CTBT and the NPT were in force, such an activity would be fraught with political hazards. There is also a high likelihood that a non-tested stockpile would in fact not function.

An important psychological impact, not usually taken into account, would occur through the weapon scientists and engineers of the advanced nuclear States. If nuclear testing is made illegal, the nuclear weapon personnel in the United States and Russia will be extremely vigorous about policing such a ban in the rest of the world, as well as in their own countries.

For these two reasons - the psychological motivation of large numbers of people in the nuclear-weapon establishment in the nuclear-weapon States to police vigorously a CTBT, and the hazards, impediments and uncertainties which a CTBT era would impose on the would-be proliferators - a CTBT would be a major tool to inhibit proliferation of nuclear weaponry.

Military and political implications

A CTBT would be an event with considerable confidence-building effects. It might strengthen the growing conviction about the uselessness of nuclear weaponry for the security of nations.

It might relieve the psychological stress associated with the apocalyptic nature of nuclear weapons.

In so far as concern about "technological surprise" has driven the arms race, a CTBT may remove one of the causes of this apprehension: it would make it unlikely that something completely new, unpredictable and exotic would suddenly emerge in the nuclear field.

Under a CTBT regime, the nuclear-weapon States would be expected to maintain high reliability of nuclear weapons to ensure deterrence. However, if confidence in the stockpiled weapons were to be gradually eroded, the probability that a nuclear-weapon Power would launch a first disarming nuclear strike would be further diminished.

A CTBT would provide a tangible proof that the nuclear-weapon Powers have decided to proceed from quantitative cuts of their arsenals to qualitative constraints.

By contributing to confidence building, a CTBT may facilitate the negotiation of other multilateral arms control measures. It is noteworthy that no multilateral nuclear arms control agreement of a global nature has been concluded since 1980.

A CTBT would signal a considerable reduction in the human and material resources which are spent on the development and modernization of nuclear weapons. The savings would be substantial; the cost of a single nuclear weapon test explosion is estimated at 30-100 million US dollars.

The conclusion of a CTBT would fulfil the pledge undertaken by the parties to the 1963 Partial Test-Ban Treaty to negotiate a total ban on nuclear weapon test explosions. It would also go some way towards meeting the obligation undertaken by the nuclear-weapon Powers under the 1968 Non-Proliferation Treaty, and included in United Nations resolutions, to bring about nuclear disarmament.

In the early days of the nuclear era, a CTBT would have had a major impact on limiting the numbers of nuclear weapons and their overall capability. Today, the major reductions that are underway in the United States and former Soviet armouries are more significant than a CTBT would be at this moment. Nevertheless, a CTBT would add to the benefits of these reductions.

II. Arguments for further testing - an assessment

Many reasons have been advanced in favour of nuclear testing. Among the main arguments are: to support the development of new nuclear weapons, to ensure confidence in the nuclear stockpile and to improve the safety and security of nuclear weapons. Some of these arguments have merit. However, they must be weighed carefully against the arguments in favour of a CTBT.

Looking back over more than three decades of occasionally intense public debate over nuclear test limitations and the advisability of a CTBT, it is striking how the arguments against a CTBT are now weakened.

During the 1980s the traditional objection in the United States to a CTBT (lack of verifiability) was supplemented by a long list of objections. Each is considered in turn below.

Safety considerations

If nuclear weapons must exist, they should be as safe and secure as possible. Nuclear weapons should be immune from accidents such as a nuclear explosion or a dispersal of plutonium if a bomb is dropped accidentally, and they should be protected from unauthorized use by both terrorists and armed forces personnel.

Questions of safety and security of nuclear weapons can be explored by analysis and non-nuclear tests. Enhanced control over nuclear weapons can be obtained by refitting modern permissive action links (PAL), but in an era in which there is a massive decrease in numbers of nuclear weapons, older weapons can be destroyed first, leaving the surviving warheads as the safest and most secure.

Not only do reduced numbers of warheads contribute to enhanced overall safety and control, but the lack of a requirement for a hairtrigger response allows them to be stored and maintained more securely.

Development of new warheads

The principal argument for nuclear testing, now as always, is to support the development of new nuclear weapons. Whatever the urgency in the past of weapon tests to develop new warheads in order to respond to developments on the other side, it is far less now.

Indeed, the argument was never compelling. When the United States sent John Glenn, the astronaut, into space, it did not redevelop him. Instead, NASA packaged him, so that he would be protected against the vacuum, cold, heat, and shock of the flight.

New delivery vehicles can be built around the existing designs of warheads. It is not necessary to develop new warheads to achieve this aim.

Finally, there are experiments in physics that can best be done with nuclear explosions and sometimes in no other way. But the physics community, in fact, has not in general proposed to spend money on such experiments, even when there was no bar to doing so.

Stockpile confidence

Much of the nuclear nations' drive for nuclear testing in the past arose from the desire to gain an advantage over the other side, or to learn what the other side might already have learned in nuclear testing or might be able to learn, so as not to be "behind" the other side.

It was argued that many deficiencies had been discovered in stockpile nuclear weapons through nuclear testing, and that they required nuclear testing to remedy. In reality, no weapon that had been thoroughly tested in development revealed unexpected troubles in stockpile testing, within the range over which it had been tested. Nuclear tests did reveal deficiencies at

extremely low ambient temperature, or with older tritium boost gas than had been used in the test. But suspected deficiencies of this type could have been countered by non-nuclear measures.

Although nuclear redesign or the substitution of a new development was sometimes the preferred "remedy", this was certainly not necessary. For the future, there is technical agreement between those in the weapon laboratories and those outside that a vigilant programme of stockpile inspection and non-nuclear testing will suffice to reveal potential problems. These problems can then be remedied by re-manufacturing the warheads to the original specifications. Fifty years from now that may not be the most convenient approach, since industrial processes will surely change, but it will just as surely be a feasible one.

The proposal is not to keep individual nuclear warheads reliable for 100 years, which would lead to a whole new field of weapon geriatrics, but to remanufacture them after 10-15 years, so that one would always be dealing with weapons precisely of an age and type with which the weapon establishments have experience.

Maintaining expertise

It is inevitable that the technological base for weapon development and stockpile maintenance will erode under a CTBT, but this process is likely to be gradual. Moreover, it is likely that the nuclear-weapon States would continue to give considerable support of their weapon laboratories, in order to ensure that essential expertise is not lost.

To prevent a kind of genetic drift by the accumulation of small changes, each one "certified" to be insignificant by a responsible board, is a matter of putting in place a board composed of responsible technical people interested in maintaining the stockpile at initial performance, rather than in incorporating "bright" ideas.

Expertise can also be maintained in the study of inertial confinement fusion (ICF), and there is, in fact, a problem of definition if one approaches useful power release from multiple explosions of tiny pellets in the ICF programme.

In the context of a CTBT, a possible approach would be to announce in advance the location and time of every explosion of any kind with an explosive yield above 10 tons, and to carry out nuclear-related explosions, such as ICF, only in permanently occupied buildings.

III. Verification of compliance with a CTBT

A CTBT would need to be accompanied by a global verification system. The principal component of such a system would be an international monitoring network of sensitive seismic stations. Such a system should make use of the most recent technological advances and also incorporate high-quality stations of the array type. On-site challenge inspection, use of satellite imagery,

measurement of airborne radionuclides and other supplementary verification measures are also envisaged. Provisions for reporting and possibly observing chemical explosions exceeding a specified size should be worked out.

The text of a CTBT should be publicized widely by all treaty parties. All parties should also enact national legislation prohibiting their citizens from engaging in activities that are banned internationally under a CTBT, including a requirement that violations must be reported to national and international authorities. In fact, verification by the people, or "whistle-blowing", might add an entirely new dimension to the effectiveness of CTBT verification. This is particularly relevant in view of the recent developments in the formerly closed Soviet society.

Given a CTBT era in which the State's commitment and its domestic legal standing is widely publicized, and in which United Nations sanctions may follow discovery of a clandestine test, it seems unlikely that a signatory State would attempt clandestine testing.

IV. Possible approaches to a CTBT

A Comprehensive Test-Ban Treaty (CTBT) would be a multilateral treaty banning all nuclear test explosions by all States for all time:

> We recommend the early signing and ratification by the nuclear-weapon States of a CTBT to take effect, say, in 1995.

If the United States and Russia decide instead to negotiate further limitations on nuclear tests, as they have pledged to do, the first step should be meaningful: it should severely constrain, if not render impossible, the development of new designs of nuclear weapons by the nuclear-weapon States and the manufacture of nuclear weapons by non-nuclear-weapon States.

A limited test ban, whatever the threshold or annual quota, may apply only to nuclear-weapon States. Any tests still permitted under such an agreement would have to be subject to stringent measures to prevent environmental damage. Any new limited test ban would have to contain a binding commitment to a total ban.

A nuclear test ban concluded among the States in particularly sensitive regions, like South Asia or the Middle East, could constitute an early step toward renunciation by these States of the nuclear weapon option.